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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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Dear Mr. Price:

In your letter dated February 3, 1972, you noted that the National Science Foundation (NSF) awarded several grants<sup>95</sup> to educational institutions in Yugoslavia. Because of the U.S. balance-of-payments deficit and the demand for funds among educational institutions in the United States, you requested that we examine into (1) the advisability of these grants, (2) why these grants had not been awarded to educational institutions in the United States, and (3) who in NSF had responsibility for authorizing such grants to the foreign institutions.

The National Science Foundation Act of 1950 (42 U.S.C. 1861) authorizes and directs NSF to (1) initiate and support scientific research and programs to strengthen scientific research potential, (2) foster the interchange of scientific information among scientists in the United States and foreign countries, and (3) initiate and support specific scientific activities relating to international cooperation or national security by making contracts or other arrangements for conducting such scientific activities.

In addition, the act authorizes NSF to provide support, within the limits of available appropriations, to organizations and individuals in the United States and foreign countries for such scientific activities as NSF deems necessary to carry out the purposes of the act and to support specific scientific activities at the request of the Secretary of State or Secretary of Defense.

NSF supports certain international activities through annual appropriation of U.S.-owned foreign currencies which the Department of the Treasury has determined to be excess to the normal requirements of the United States. The appropriation may be used for conducting research and for supporting scientific activities in foreign countries, including programs and projects of scientific cooperation between the United States and other countries. Foreign currency appropriations to NSF for fiscal years 1971 and 1972 totaled \$5 million. NSF's

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foreign currency budget estimate for fiscal year 1973 is \$7 million.

In fiscal year 1971 NSF established the Special Foreign Currency Program to administer foreign currency appropriations. The program is directed by the NSF Assistant Director for National and International Programs. The program's primary objectives are to encourage the formation of cooperative relationships between U.S. and foreign scientists and institutions and to strengthen U.S. science and science education. Activities supported under the program include (1) cooperative research and education projects involving U.S. and foreign scientists, (2) international travel by U.S. scientists to attend scientific meetings, (3) visits by U.S. scientists to foreign institutions to teach or conduct research, and (4) English translations of foreign scientific and technological literature.

NSF's budget justification for fiscal year 1973 shows that, from inception of the Special Foreign Currency Program through December 1971, NSF sponsored the following activities in excess foreign currency countries.

- 21 cooperative research grants were awarded for research projects in Yugoslavia, Egypt, and Poland.
- 96 grants were awarded to U.S. scientists to support their attendance at international conferences, congresses, and symposia or their participation in the development of joint projects to be conducted in Yugoslavia, Poland, India, Morocco, and Tunisia.
- Contracts for foreign science information translations were awarded to organizations in India, Israel, Pakistan, Poland, Tunisia, and Yugoslavia.

Grants under the Special Foreign Currency Program generally are awarded on the basis of unsolicited proposals. Proposals received by NSF are reviewed by its staff and by scientists from academic, government, or industrial institutions. Reviewers include specialists familiar with the types of scientific activity being proposed.

Proposals are reviewed for their scientific merit. Proposals are also assessed for their potential for (1) strengthening cooperation between scientific communities of the United States and other countries, (2) achieving the stated objectives of the project, (3) strengthening the scientific capabilities in the United States and the participating country, and (4) strengthening the scientific programs of the institutions of the participating scientists. The results of the review are considered by NSF in deciding whether to award a grant or contract.

Generally the NSF Assistant Director for National and International Programs may approve grant awards under the Special Foreign Currency Program. But, recommendations for grants which exceed a total commitment of \$2 million or an annual commitment of \$500,000 must be reviewed and approved by the National Science Board, the policymaking body of NSF. Also, because the grants involve a foreign country and the use of excess foreign currencies, they must be approved by the Secretary of State.

Regarding the benefits of the Special Foreign Currency Program, NSF's budget justification for fiscal year 1973 states:

"The scientific activities supported under this program are considered to be of great value to the U.S. scientific community, but are not of sufficiently high priority to warrant their funding from the Foundation's limited dollar appropriation. The utilization of excess foreign currencies thus provides a means for accomplishing research and science education projects of mutual benefit to the U.S. and the cooperating countries, with funds that were provided through U.S. foreign assistance programs. This program, therefore, represents a means for the U.S. to derive significant benefits from these programs."

Because grants under the program are supported by NSF's special foreign currency appropriation, such grants do not compete with research support available to U.S. institutions through NSF's dollar appropriation.

The five NSF grants to educational institutions in Yugoslavia, which were listed in the enclosure to your letter, were awarded under the Special Foreign Currency Program. These grants provided support for cooperative research projects involving foreign and U.S. scientists. Under such grants U.S. scientists may work jointly with foreign scientists on research projects; may pursue research closely related to research undertaken by foreign scientists and serve as advisors; or, as principal investigators, may perform the research at foreign institutions.

Information obtained from NSF records concerning the objectives, significance, and cooperative aspects of the five grants is summarized below.

Grant GF 031389, Studies on Tissue Proteinases--Research under this grant involves the study of intercellular proteolytic enzymes in the cells of organisms. The grant proposal indicates that such enzymes play an important role in the development of cancer and other pathological conditions. The grant provided for research to be conducted by the Josef Stefan Institute, Yugoslavia, and to be monitored by a scientist at the University of Arizona. In January 1972 NSF awarded a foreign currency grant totaling \$76,701 (of which \$1,200 was for travel of the U.S. scientist to Yugoslavia) to the Josef Stefan Institute to support the project for 36 months.

Grant GF 031947, Primary Production of the Northern Adriatic Sea--Research under this grant seeks primarily to determine the seasonal and spatial patterns of primary productivity in the northern Adriatic Sea and the relationship of productivity to the physical and chemical factors involved with particular interest toward the influence of pollution from the Po River. The grant proposal indicates that water fisheries of the mid-Adriatic and southern Adriatic depend, to a large extent, on the health of northern waters and, therefore, information on primary production systems in the northern Adriatic will be of basic importance to further studies of fisheries of the entire sea. The project will be conducted jointly by the Stanford University and the Rudjer Boskovic Institute, Yugoslavia. NSF intends to support the project for a period of 42 months, and

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in January 1972 it provided initial support for the project through awards of separate 18-month grants to each institute. NSF awarded a dollar grant of \$46,500 to Stanford University and a foreign currency grant of \$90,052 to the Yugoslavia institute.

Grant GF 31826, Mechanism of Irreversible Changes in Hemorrhagic Shock--Research under this grant involves a study of metabolic changes that result from hemorrhaging. This study could lead to a better understanding of the pathophysiological mechanism of experimental and clinical shock, particularly at the cellular level, and thus contribute to more rational therapeutic measures in shock. The grant provides for research to be conducted by the University of Sarajevo, Yugoslavia, and monitored by a scientist at the Medical College of Wisconsin, Milwaukee, Wisconsin. In January 1972 NSF awarded a foreign currency grant totaling \$70,670 (of which \$3,334 was for travel of the U.S. scientist to Yugoslavia) to the University of Sarajevo to support the project for 24 months.

Grant GF 032046, Thermodynamics and Kinetics of Ion Exchange Processes on Inorganic Ion Exchangers--The planned work under this grant is to study the thermodynamics and kinetics of reactions which occur on inorganic ion exchangers. Ion exchange selectivity with these materials is not well understood at present, and the results of the work to be conducted will contribute to the basic knowledge of the ion exchange process. This project was initiated by Ohio University, Athens, Ohio, under a dollar grant totaling \$35,900 awarded by NSF in September 1970. In January 1972 NSF awarded a foreign currency grant totaling \$39,996 to the Boris Kidric Institute, Yugoslavia, to conduct joint research on this project for 24 months. In May 1972 NSF awarded a \$5,800 supplemental grant to Ohio University extending the university's participation in the project through March 1973 and increasing the grant total to \$41,700.

Grant GF 031948--Legged Locomotion in Animals and Machines--Under this grant existing theoretical knowledge about the general mathematical theory of legged locomotion will be drawn together in a more unified structure. The finite state,

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kinematic and dynamic aspects of locomotion for both animals and machines will be examined. Results obtained from the research should be applicable both to the design of legged robots and to the analysis and improvement of prosthetic and "orthotic" appliances. The project was initiated by Ohio State University Research Foundation, Columbus, Ohio, under a dollar grant totaling \$57,800 awarded by NSF in September 1970 to support the project for 24 months. In March 1971 NSF awarded a \$9,300 supplement grant to the Research Foundation which increased the grant total to \$67,100. In January 1972 NSF awarded a 12-month foreign currency grant totaling \$35,000 to the Michailo Pupin Institute, Yugoslavia, to conduct joint research on the project.

NSF records indicate that these five project proposals were reviewed, evaluated, and approved in accordance with NSF's regular procedures, and we, therefore, have no basis upon which to question the advisability of the awards or the scientific merit of the projects.

We trust that this information will meet your needs.

Sincerely yours,



Comptroller General  
of the United States

g/ The Honorable Robert D. Price  
House of Representatives

